

### **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application.

#### Listing of Claims:

Claim 1. (currently amended) A process for preparing diblock and triblock copolymers comprising the steps of:

(a) performing radical polymerization of N-vinyl-2-pyrrolidone in the presence of a radical initiator, a chain transfer agent and an alcoholic solvent to form hydroxy-terminated poly (N-vinylpyrrolidone) wherein said hydroxy-terminated poly (N-vinylpyrrolidone) is isolated by dissolution and precipitation; and

(b) performing ionic polymerization of monomers or comonomers selected from the group consisting of 3,6-dimethyl-1,4-dioxane-2,5-dione,  $\epsilon$ -caprolactone,  $\gamma$ -caprolactone poly(D,L-lactide), poly(D-lactide), poly (L-lactide), poly( $\epsilon$ -caprolactone) and poly ( $\gamma$ -caprolactone) in the presence of a catalyst and a macroinitiator wherein said macroinitiator is the hydroxy-terminated poly (N-vinylpyrrolidone) formed in step (a) thereby preparing said diblock and triblock copolymers, wherein said copolymers self-assemble in polymeric micelles or stabilized nanoparticles in aqueous solution.

Claims 2-6. (cancelled)

Claim 7. (original) The process in accordance with claim 1 wherein said alcoholic solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, n-propanol, n-butanol, 2-butanol, *tert*-butanol, 1-pentanol and 2-pentanol.

Claim 8. (original) The process in accordance with claim 1 wherein said chain transfer agent is a thiol derivative selected from the group consisting of 2-mercaptoethanol, 3-mercapto-1-propanol, 3-mercapto-2-propanol, 4-mercapto-1-butanol, 3-mercapto-2-butanol and 6-mercapto-1-hexanol.

Claim 9. (original) The process in accordance with claim 1 wherein said radical initiator is an azo derivative selected from the group consisting of 2,2'-azobis(2-methyl-N-(2-hydroxyethyl)-propionamide); 2,2'-azobis(2-methyl-N-[2-(1-hydroxybutyl)]propionamide and 1,1'-azobis(cyclohexane-carbonitrile).

Claim 10. (original) The process in accordance with claim 1 wherein said catalyst is aluminum or tin alkoxides.

Claim 11. (original) The process in accordance with claim 1 wherein said poly(N-vinylpyrrolidone) formed in step (a) comprises a hydroxyl group on at least one chain end.

Claim 12. (cancelled)

Claim 13. (currently amended) The process in accordance with claim [[12]] 1 wherein the solvent for said dissolution is selected from the group consisting of methanol, ethanol, isopropanolisopropyl alcohol, acetone, 2-butanone, 4-methyl-2-pentanone, dichloromethane and tetrahydrofuran.

Claim 14. (original) The process in accordance with claim 13 wherein at least two solvents are combined for said dissolution.

Claim 15. (currently amended) The process in accordance with claim [[12]] 1 wherein the solvent for said precipitation is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 16. (original) The process in accordance with claim 15 wherein at least two solvents are combined for said precipitation.

Claim 17. (original) The process in accordance with claim 1 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried under vacuum at a final temperature over 100°C.

Claim 18. (original) The process in accordance with claim 1 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried by azeotropic distillation using an inert organic solvent.

Claim 19. (original) The process in accordance with claim 18 wherein said inert organic solvent is selected from the group consisting of toluene, xylene derivatives and heptane derivatives.

Claim 20. (original) The process in accordance with claim 1 wherein said diblock and triblock copolymers are isolated by precipitation using an inert organic solvent.

Claim 21. (original) The process in accordance with claim 20 wherein said inert organic solvent is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 22. (original) The process in accordance with claim 21 wherein at least two inert organic solvents are combined for said precipitation.

Claim 23. (original) The process in accordance with claim 1 wherein said diblock and triblock copolymers are purified by charcoal treatment.

Claim 24. (original) The process in accordance with claim 1 wherein said poly(N-vinylpyrrolidone) formed in step (a) has a molecular weight between 1,000 D and 700 kD.

Claim 25. (original) The process in accordance with claim 1 wherein said diblock and triblock copolymers have a molecular weight between 2,000 D and 700 kD.

Claims 26-27. (cancelled)

Claim 28. (original) The diblock copolymer prepared by the process of claim 1.

Claim 29. (original) The diblock copolymer of claim 28 wherein said diblock copolymer is poly(N-vinylpyrrolidone)-*block*-poly (D, L -lactide).

Claim 30. (original) The triblock copolymer prepared by the process of claim 1.

Claim 31. (original) The triblock copolymer of claim 30 wherein said triblock copolymer is poly(D,L-lactide)-*block*-poly (N-vinylpyrrolidone)-*block*-poly (D, L-lactide).

Claim 32. (withdrawn) A process for preparing diblock and triblock copolymers comprising the steps of:

(a) performing radical polymerization of N-vinyl-2-pyrrolidone in the presence of a radical initiator, a chain transfer agent and an alcoholic solvent to form hydroxy-terminated poly (N-vinylpyrrolidone) and

(b) performing ionic polymerization of monomers or comonomers in the presence of a base and a macroinitiator wherein said macroinitiator is the hydroxy-terminated poly (N-vinylpyrrolidone) formed in step (a) thereby preparing said diblock and triblock copolymers.

Claim 33. (withdrawn) The process in accordance with claim 32 wherein said monomers or comonomers are cyclic or vinylic.

Claim 34. (withdrawn) The process in accordance with claim 33 wherein said monomers are cyclic and are selected from the group consisting of 3,6-dimethyl-1,4-dioxane-2,5-dione,  $\epsilon$ -caprolactone and  $\gamma$ -caprolactone.

Claim 35. (withdrawn) The process in accordance with claim 32 wherein said monomers or comonomers are polyester.

Claim 36. (withdrawn) The process in accordance with claim 35 wherein said polyester is degradable.

Claim 37. (withdrawn) The process in accordance with claim 36 wherein said polyester is selected from the group consisting of poly(D,L-lactide), poly(D-lactide), poly (L-lactide), poly( $\epsilon$ -caprolactone) and poly ( $\gamma$ -caprolactone).

Claim 38. (withdrawn) The process in accordance with claim 32 wherein said alcoholic solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, n-propanol, n-butanol, 2-butanol, *tert*-butanol, 1-pentanol and 2-pentanol.

Claim 39. (withdrawn) The process in accordance with claim 32 wherein said chain transfer agent is a thiol derivative selected from the group consisting of 2-mercaptoethanol, 3-mercapto-1-propanol, 3-mercapto-2-propanol, 4-mercapto-1-butanol, 3-mercapto-2-butanol and 6-mercapto-1-hexanol.

Claim 40. (withdrawn) The process in accordance with claim 32 wherein said radical initiator is an azo derivative selected from the group consisting of 2,2'-azobis(2-methyl-N-(2-hydroxyethyl)-propionamide); 2,2'-azobis(2-methyl-N-[2-(1-hydroxybutyl)]propionamide and 1,1'-azobis(cyclohexane-carbonitrile).

Claim 41. (withdrawn) The process in accordance with claim 32 wherein said base is potassium or sodium hydride.

Claim 42. (withdrawn) The process in accordance with claim 32 wherein said poly(N-vinylpyrrolidone) formed in step (a) comprises a hydroxyl group on at least one chain end.

Claim 43. (withdrawn) The process in accordance with claim 32 wherein said poly (N-vinylpyrrolidone) formed in step (a) is isolated by dissolution and precipitation.



Claim 44. (withdrawn) The process in accordance with claim 43 wherein the solvent for said dissolution is selected from the group consisting of methanol, ethanol, isopropanolisopropyl alcohol, acetone, 2-butanone, 4-methyl-2-pentanone, dichloromethane and tetrahydrofuran.

Claim 45. (withdrawn) The process in accordance with claim 44 wherein at least two solvents are combined for said dissolution.

Claim 46. (withdrawn) The process in accordance with claim 43 wherein the solvent for said precipitation is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 47. (withdrawn) The process in accordance with claim 46 wherein at least two solvents are combined for said precipitation.

Claim 48. (withdrawn) The process in accordance with claim 32 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried under vacuum at a final temperature over 100°C.

Claim 49. (withdrawn) The process in accordance with claim 32 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried by azeotropic distillation using an inert organic solvent.

Claim 50. (withdrawn) The process in accordance with claim 49 wherein said inert organic solvent is selected from the group consisting of toluene, xylene derivatives and heptane derivatives.

Claim 51. (withdrawn) The process in accordance with claim 32 wherein said diblock and triblock copolymers are isolated by precipitation using an inert organic solvent.

Claim 52. (withdrawn) The process in accordance with claim 51 wherein said inert organic solvent is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 53. (withdrawn) The process in accordance with claim 52 wherein at least two inert organic solvents are combined for said precipitation.

Claim 54. (withdrawn) The process in accordance with claim 32 wherein said diblock and triblock copolymers are purified by charcoal treatment.

Claim 55. (withdrawn) The process in accordance with claim 32 wherein said poly(N-vinylpyrrolidone) formed in step (a) has a molecular weight between 1,000 D and 700 kD.

Claim 56. (withdrawn) The process in accordance with claim 32 wherein said diblock and triblock copolymers have a molecular weight between 2,000 D and 700 kD.

Claim 57. (withdrawn) The process in accordance with claim 32 wherein said diblock and triblock copolymers self-assemble in polymeric micelles in aqueous solution.

Claim 58. (withdrawn) The process in accordance with claim 32 wherein said diblock and triblock copolymers self-assemble in stabilized nanoparticles in aqueous solution.

Claim 59. (withdrawn) The diblock copolymer prepared by the process of claim 32.

Claim 60. (withdrawn) The diblock copolymer of claim 59 wherein said diblock copolymer is poly(N-vinylpyrrolidone)-*block*-poly (D, L -lactide).

Claim 61. (withdrawn) The triblock copolymer prepared by the process of claim 32.

Claim 62. (withdrawn) The triblock copolymer of claim 61 wherein said triblock copolymer is poly(D,L-lactide)-*block*-poly (N-vinylpyrrolidone)-*block*-poly (D, L-lactide).

Claim 63. (withdrawn) A process for preparing diblock and triblock copolymers comprising the steps of:

(a) performing radical polymerization of N-vinyl-2-pyrrolidone in the presence of a radical initiator and an alcoholic solvent to form hydroxy-terminated poly (N-vinylpyrrolidone) and

(b) performing ionic polymerization of monomers or comonomers in the presence of a catalyst and a macroinitiator wherein said macroinitiator is the hydroxy-terminated poly (N-vinylpyrrolidone) formed in step (a) thereby preparing said diblock and triblock copolymers.

Claim 64. (withdrawn) The process in accordance with claim 63 wherein said monomers or comonomers are cyclic or vinylic.

Claim 65. (withdrawn) The process in accordance with claim 64 wherein said monomers are cyclic and are selected from the group consisting of 3,6-dimethyl-1,4-dioxane-2,5-dione,  $\epsilon$ -caprolactone and  $\gamma$ -caprolactone.

Claim 66. (withdrawn) The process in accordance with claim 63 wherein said monomers or comonomers are polyester.

Claim 67. (withdrawn) The process in accordance with claim 66 wherein said polyester is degradable.

Claim 68. (withdrawn) The process in accordance with claim 67 wherein said polyester is selected from the group consisting of poly(D,L-lactide), poly(D-lactide), poly (L-lactide), poly( $\epsilon$ -caprolactone) and poly ( $\gamma$ -caprolactone).

Claim 69. (withdrawn) The process in accordance with claim 63 wherein said alcoholic solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, n-propanol, -butanol, 2-butanol, *tert*-butanol, 1-pentanol and 2-pentanol.

Claim 70. (withdrawn) The process in accordance with claim 63 wherein said radical initiator is an azo derivative selected from the group consisting of 2,2'-azobis(2-methyl-N-(2-hydroxyethyl)-propionamide); 2,2'-azobis(2-methyl-N-[2-(1-hydroxybutyl)]propionamide and 1,1'-azobis(cyclohexane-carbonitrile).

Claim 71. (withdrawn) The process in accordance with claim 63 wherein said catalyst is aluminum or tin alkoxides.

Claim 72. (withdrawn) The process in accordance with claim 63 wherein said poly(N-vinylpyrrolidone) formed in step (a) comprises a hydroxyl group on at least one chain end.

Claim 73. (withdrawn) The process in accordance with claim 63 wherein said poly (N-vinylpyrrolidone) formed in step (a) is isolated by dissolution and precipitation.

Claim 74. (withdrawn) The process in accordance with claim 73 wherein the solvent for said dissolution is selected from the group consisting of methanol, ethanol, isopropanol, isopropyl alcohol, acetone, 2-butanone, 4-methyl-2-pentanone, dichloromethane and tetrahydrofuran.

Claim 75. (withdrawn) The process in accordance with claim 74 wherein at least two solvents are combined for said dissolution.

Claim 76. (withdrawn) The process in accordance with claim 73 wherein the solvent for said precipitation is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 77. (withdrawn) The process in accordance with claim 76 wherein at least two solvents are combined for said precipitation.

Claim 78. (withdrawn) The process in accordance with claim 63 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried under vacuum at a final temperature over 100°C.

Claim 79. (withdrawn) The process in accordance with claim 63 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried by azeotropic distillation using an inert organic solvent.

Claim 80. (withdrawn) The process in accordance with claim 79 wherein said inert organic solvent is selected from the group consisting of toluene, xylene derivatives and heptane derivatives.

Claim 81. (withdrawn) The process in accordance with claim 63 wherein said diblock and triblock copolymers are isolated by precipitation using an inert organic solvent.

Claim 82. (withdrawn) The process in accordance with claim 81 wherein said inert organic solvent is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 83. (withdrawn) The process in accordance with claim 82 wherein at least two inert organic solvents are combined for said precipitation.

Claim 84. (withdrawn) The process in accordance with claim 63 wherein said diblock and triblock copolymers are purified by charcoal treatment.

Claim 85. (withdrawn) The process in accordance with claim 63 wherein said poly(N-vinylpyrrolidone) formed in step (a) has a molecular weight between 1,000 D and 700 kD.



Claim 86. (withdrawn) The process in accordance with claim 63 wherein said diblock and triblock copolymers have a molecular weight between 2,000 D and 700 kD.

Claim 87. (withdrawn) The process in accordance with claim 63 wherein said diblock and triblock copolymers self-assemble in polymeric micelles in aqueous solution.

Claim 88. (withdrawn) The process in accordance with claim 63 wherein said diblock and triblock copolymers self-assemble in stabilized nanoparticles in aqueous solution.

Claim 89. (withdrawn) The diblock copolymer prepared by the process of claim 63.

Claim 90. (withdrawn) The diblock copolymer of claim 89 wherein said diblock copolymer is poly(N-vinylpyrrolidone)-*block*-poly (D, L -lactide).

Claim 91. (withdrawn) The triblock copolymer prepared by the process of claim 63.

Claim 92. (withdrawn) The triblock copolymer of claim 91 wherein said triblock copolymer is poly(D,L-lactide)-*block*-poly (N-vinylpyrrolidone)-*block*-poly (D, L-lactide).

Claim 93. (withdrawn) A process for preparing diblock and triblock copolymers comprising the steps of:

(a) performing radical polymerization of N-vinyl-2-pyrrolidone in the presence of a radical initiator and an alcoholic solvent to form hydroxy-terminated poly (N-vinylpyrrolidone) and

(b) performing ionic polymerization of monomers or comonomers in the presence of a base and a macroinitiator wherein said macroinitiator is the hydroxy-terminated poly (N-vinylpyrrolidone) formed in step (a) thereby preparing said diblock and triblock copolymers.

Claim 94. (withdrawn) The process in accordance with claim 93 wherein said monomers or comonomers are cyclic or vinylic.

Claim 95. (withdrawn) The process in accordance with claim 94 wherein said monomers are cyclic and are selected from the group consisting of 3,6-dimethyl-1,4-dioxane-2,5-dione,  $\epsilon$ -caprolactone and  $\gamma$ -caprolactone.

Claim 96. (withdrawn) The process in accordance with claim 93 wherein said monomers or comonomers are polyester.

Claim 97. (withdrawn) The process in accordance with claim 96 wherein said polyester is degradable.

Claim 98. (withdrawn) The process in accordance with claim 97 wherein said polyester is selected from the group consisting of poly(D,L-lactide), poly(D-lactide), poly (L-lactide), poly( $\epsilon$ -caprolactone) and poly ( $\gamma$ -caprolactone).

Claim 99. (withdrawn) The process in accordance with claim 93 wherein said alcoholic solvent is selected from the group consisting of methanol, ethanol, isopropyl alcohol, n-propanol, n-butanol, 2-butanol, *tert*-butanol, 1-pentanol and 2-pentanol.

Claim 100. (withdrawn) The process in accordance with claim 93 wherein said radical initiator is an azo derivative selected from the group consisting of 2,2'-azobis(2-methyl-N-(2-hydroxyethyl)-propionamide); 2,2'-azobis(2-methyl-N-[2-(1-hydroxybutyl)]propionamide and 1,1'-azobis(cyclohexane-carbonitrile).

Claim 101. (withdrawn) The process in accordance with claim 93 wherein said base is potassium or sodium hydride.

Claim 102. (withdrawn) The process in accordance with claim 93 wherein said poly(N-vinylpyrrolidone) formed in step (a) comprises a hydroxyl group on at least one chain end.

Claim 103. (withdrawn) The process in accordance with claim 93 wherein said poly (N-vinylpyrrolidone) formed in step (a) is isolated by dissolution and precipitation.

Claim 104. (withdrawn) The process in accordance with claim 103 wherein the solvent for said dissolution is selected from the group consisting of methanol, ethanol, isopropanol, isopropyl alcohol, acetone, 2-butanone, 4-methyl-2-pentanone, dichloromethane and tetrahydrofuran.

Claim 105. (withdrawn) The process in accordance with claim 104 wherein at least two solvents are combined for said dissolution.

Claim 106. (withdrawn) The process in accordance with claim 103 wherein the solvent for said precipitation is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 107. (withdrawn) The process in accordance with claim 106 wherein at least two solvents are combined for said precipitation.

Claim 108. (withdrawn) The process in accordance with claim 93 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried under vacuum at a final temperature over 100°C.

Claim 109. (withdrawn) The process in accordance with claim 93 wherein said poly (N-vinylpyrrolidone) formed in step (a) is dried by azeotropic distillation using an inert organic solvent.

Claim 110. (withdrawn) The process in accordance with claim 109 wherein said inert organic solvent is selected from the group consisting of toluene, xylene derivatives and heptane derivatives.

Claim 111. (withdrawn) The process in accordance with claim 93 wherein said diblock and triblock copolymers are isolated by precipitation using an inert organic solvent.

Claim 112. (withdrawn) The process in accordance with claim 111 wherein said inert organic solvent is selected from the group consisting of diethyl ether, *tert*-butyl methyl ether, hexane derivatives, heptane derivatives, ethyl acetate, isopropyl acetate, toluene and xylene derivatives.

Claim 113. (withdrawn) The process in accordance with claim 112 wherein at least two inert organic solvents are combined for said precipitation.

Claim 114. (withdrawn) The process in accordance with claim 93 wherein said diblock and triblock copolymers are purified by charcoal treatment.

Claim 115. (withdrawn) The process in accordance with claim 93 wherein said poly(N-vinylpyrrolidone) formed in step (a) has a molecular weight between 1,000 D and 700 kD.

Claim 116. (withdrawn) The process in accordance with claim 93 wherein said diblock and triblock copolymers have a molecular weight between 2,000 D and 700 kD.

Claim 117. (withdrawn) The process in accordance with claim 93 wherein said diblock and triblock copolymers self-assemble in polymeric micelles in aqueous solution.

Claim 118. (withdrawn) The process in accordance with claim 93 wherein said diblock and triblock copolymers self-assemble in stabilized nanoparticles in aqueous solution.

Claim 119. (withdrawn) The diblock copolymer prepared by the process of claim 93.

Claim 120. (withdrawn) The diblock copolymer of claim 119 wherein said diblock copolymer is poly(N-vinylpyrrolidone)-*block*-poly (D, L -lactide).

Claim 121. (withdrawn) The triblock copolymer prepared by the process of claim 93.

Claim 122. (withdrawn) The triblock copolymer of claim 121 wherein said triblock copolymer is poly(D,L-lactide)-*block*-poly (N-vinylpyrrolidone)-*block*-poly (D, L-lactide).